

**REMARKS**

Claims 30-48 are pending in this application. By this Amendment, claims 1-29 are cancelled without prejudice to or disclaimer of the subject matter contained therein; and claims 30-48 have been added. Claims 30-48 correspond to allowed claims in the corresponding European application. No new matter is added. Claims 30 and 40 are the independent claims. Favorable reconsideration of this application, in light of the preceding amendments and following remarks, is respectfully requested.

Applicants note with appreciation the Examiner's acknowledgement that certified copies of all priority documents have been received from the International Bureau. Action, summary at 12.

Applicants also note the present action indicates that the drawings have been accepted by the Examiner. Action, summary at 10.

Applicants also note with appreciation the Examiner's consideration of the references cited in the Information Disclosure Statements filed on December 9, 2005, and March 31, 2006.

**Claim Rejections - 35 U.S.C. § 103**

Claims 1-2, 4-7, 15-17, 19-23, and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 (JP '336) in view of Japanese Patent Publication 59-206151 (JP '151). Applicants respectfully traverse this rejection for the reasons detailed below.

Initially, Applicants submit that the rejection to claims 1-2, 4-7, 15-17, 19-23, and 29, have been rendered moot as these claims have been cancelled by this Amendment. Nonetheless, Applicants respectfully submit that claims 30-48 are patentably distinct over JP '336 and JP '151.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), all of the claim limitations of the rejected claims must be described or suggested by the cited document(s).<sup>1</sup> Applicants respectfully submit that the cited documents do not meet this criteria, because no combination and/or modification of the JP '336 and JP '151 references disclose or suggest all of the claim limitations of rejected claims 30-48, and therefore, a *prima facie* case of obviousness has not been established.

For example, claim 1 recites, *inter alia*:

mounting said forked coil holder to a shroud manipulator adapted to manipulate the shroud, and thereby keeping the coils unmovable relative to the shroud. (*emphasis added*)

Applicants respectfully submit that the JP '336 and JP '151 references do not disclose or suggest the above feature.

While the JP '336 describes a transmitting and a receiving coil 40, 42 for detecting slag in a shroud, and the coils are mounted in a forked coil holder 30, (*see FIGS. 1 and 2 of the JP '336 reference*), it is respectfully submitted that the device of the JP '336 reference does not teach or suggest the claimed invention. For example, the forked coil holder of the JP '336 reference is manipulated by a separate manipulator 32, such that the coils move with respect to the movement of the separate manipulator (*see FIG. 1 of the JP '336 reference*). By contrast, the claimed invention discloses that the forked coil holder is mounted to a shroud manipulator and that the forked coil holder is mounted to the shroud manipulator so that the *coils are in a stationary position relative to the shroud*. In other words, JP '336 fails to disclose, or even suggest, *inter alia*, "mounting said forked coil holder to a shroud manipulator adapted to manipulate the shroud, and thereby *keeping the coils unmovable relative to the shroud*," as recited in claim 30.

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<sup>1</sup> See *In Re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See also MPEP § 2143.03.

With respect to the JP '151 reference, Applicants respectfully submit that the JP '151 reference also fails to disclose or suggest the feature of "mounting said forked coil holder to a shroud manipulator adapted to manipulate the shroud, and thereby keeping the coils unmovable relative to the shroud." Instead, the JP '151 reference discloses a slag detector device which is mounted to an end of a "sliding rod." (*see Abstract and FIG. 1 of the JP '151 reference*). The sliding rod is mounted to a device for "swiveling, elevating, and moving forward and backward the rod," which implies that the device for moving the rod is mounted to the shroud manipulator and, therefore, moving the coils relative to the shroud.

In addition, although the Examiner may be correct in that the slag detector of the JP '151 reference may be integrated with the shroud manipulator, albeit, via the rod moving device, the slag detector, however, is not "*kept immovable relative to the shroud*" because it is mounted to the shroud manipulator. That is, the device according to the JP '151 reference includes a rod moving device arranged to move the slag detector relative to the shroud manipulator, and accordingly, the mounted slag detector according to the JP '151 reference cannot provide the feature of achieving a constant positional relations between the slag detector and the shroud.

Since the rejection fails to disclose or suggest each and every element of the rejected claims, Applicants respectfully submit that no *prima facie* case of obviousness has been established with respect to claim 30.

Further, one skilled in the art would appreciate that the design of the JP '151 reference is undesirable for detecting slag in flow of molten metal. In particular, the rod moving device of the JP '151 reference is arranged to press the slag detecting device directly against the shroud, i.e., support the slag detector close to the shroud. However, in such a construction, there is no indication of relative movements of the shroud and the slag detector, in which high surface temperature of the shroud is often a problem for more sensitive coils of a slag detector.

Therefore, it is advantageous to support the slag detector at a distance from the shroud as taught by the present invention.

In addition, in order to establish a *prima facie* case of obviousness, the Examiner must establish that it would have been obvious for one of ordinary skill to have combined the teachings of the cited documents.<sup>2</sup> One way to establish this would be to show “some articulated reasoning with some rationale underpinning to support the legal conclusion of obviousness” and “identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.”<sup>3</sup> Furthermore, the Examiner must make “*explicit*” this rationale of “the apparent reason to combine the known elements in the fashion claimed,” including a detailed explanation of “the effects of demands known to the design community or present in the marketplace” and “the background knowledge possessed by a person having ordinary skill in the art.”<sup>4</sup>

It is respectfully submitted that the Examiner has not met these criteria. For example, the Examiner asserts that:

it would have been obvious to one having ordinary skill in the art to provide JP 54-119336 the use of an integrated shroud manipulator as taught by JP 59-206151 in order to reduce the relative motion between the shroud and detector and improve the accuracy of the slag detector (JP 59-206159, abstract). (emphasis added)

However, it is respectfully submitted that the above statement is merely conclusory and do not comprise an “*explicit rationale*” as required by *KSR Int'l*. In other words, the purpose of the JP ‘151 reference is to allow for a quick attachment and detachment of a slag detector (*see Abstract*), and not, as stated by the Examiner, to improve the accuracy of the slag detector.

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<sup>2</sup> See *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. at \_\_, 82 USPQ2d at 1396 (2007).

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

Therefore, because the Examiner has not provided an explicit analysis as required by *KSR Int'l*, a *prima facie* case of obviousness has not been established.

In view of the above, Applicants respectfully submit that the JP '336 and JP '151 references fail to teach or suggest each and every element of claim 30, and therefore, claim 30 is allowable over the cited prior art. Claim 40 is also allowable for the similar reasons discussed above regarding claim 30. Claims 31-39 and 41-48 are dependent from either claims 30 or 40, and therefore, also allowable. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 in view of Japanese Patent Publication 59-206151 as applied to claims 1-2, 4-7, 15-17, 19-23 and 29 above, and further in view of U.S. Patent 6,737,014 to Davidkhanian et al. ("Davidkhanian"). Applicants respectfully traverse this rejection for the reasons detailed below.

Claim 8 has been rendered moot as claim 8 has been cancelled by this Amendment. Nonetheless, the subject matter found in claim 8 is believed to be allowable for at least the reasons set forth above regarding claims 30 and 40, and by virtue of its dependency on either claims 30 or 40. The Davidkhanian reference fails to provide the teachings noted above as missing from the JP '336 and JP '151. Applicants respectfully request that the rejection of claim 8 under 35 U.S.C. § 103(a) be withdrawn.

Claims 3, 9 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 in view of Japanese Patent Publication 59-206151 as applied to claims 1-2, 4-7, 15-17, 19-23 and 29 above, and further in view of U.S. Patent 4,816,758 to Theissen et al. ("Theissen"). Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 3, 9 and 18 have been rendered moot as claims 3, 9 and 18 have been cancelled by this Amendment. Nonetheless, the subject matter found in claims 3, 9 and 18 are believed to be allowable for at least the reasons set forth above regarding claims 30 and 40, and by virtue of their dependency on either claims 30 or 40. The Theissen reference fails to provide the teachings noted above as missing from the JP '336 and JP '151. Applicants respectfully request that the rejection of claims 3, 9 and 18 under 35 U.S.C. § 103(a) be withdrawn.

Claims 10-14 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 in view of Japanese Patent Publication 59-206151 as applied to claims 1-2, 4-7, 15-17, 19-23 and 29 above, and further in view of U.S. Patent 5,549,280 to Kings et al. ("Kings"). Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 10-14 and 24 have been rendered moot as claims 10-14 and 24 have been cancelled by this Amendment. Nonetheless, the subject matter found in claims 10-14 and 24 are believed to be allowable for at least the reasons set forth above regarding claims 30 and 40, and by virtue of their dependency on either claims 30 or 40. The Kings reference fails to provide the teachings noted above as missing from the JP '336 and JP '151. Applicants respectfully request that the rejection of claims 10-14 and 24 under 35 U.S.C. § 103(a) be withdrawn.

Claims 25-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 in view of Japanese Patent Publication 59-206151 and further in view of Kings as applied to claims 10-14 and 24 above, and further in view of U.S. Patent 6,539,605 to Heaslip et al. ("Heaslip"). Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 25-27 have been rendered moot as claims 25-27 have been cancelled by this Amendment. Nonetheless, the subject matter found in claims 25-27 are believed to be allowable

for at least the reasons set forth above regarding claims 30 and 40, and by virtue of their dependency on either claims 30 or 40. The Heaslip reference fails to provide the teachings noted above as missing from the JP '336 and JP '151. Applicants respectfully request that the rejection of claims 25-27 under 35 U.S.C. § 103(a) be withdrawn.

Claim 28 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication 54-119336 in view of Japanese Patent Publication 59-206151 as applied to claims 1-2, 4-7, 15-17, 19-23 and 29 above, and further in view of Japanese Patent Publication 54-110932. Applicants respectfully traverse this rejection for the reasons detailed below.

Claim 28 has been rendered moot as claim 28 has been cancelled by this Amendment. Nonetheless, the subject matter found in claim 28 is believed to be allowable for at least the reasons set forth above regarding claims 30 and 40, and by virtue of its dependency on either claims 30 or 40. The JP 54-110932 reference fails to provide the teachings noted above as missing from the JP '336 and JP '151. Applicants respectfully request that the rejection of claim 28 under 35 U.S.C. § 103(a) be withdrawn.

### CONCLUSION

In view of the above remarks and amendments, Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. Further, the above remarks demonstrate the failings of the outstanding rejections, and are sufficient to overcome the rejections. However, these remarks are not intended to, nor need they, comprehensively address each and every reason for the patentability of the claimed subject matter over the applied prior art. Accordingly, Applicants do not contend that the claims are patentable solely on the basis of the particular claim elements discussed above.

Pursuant to 37 CFR §§ 1.17 and 1.136(a), Applicants petition for a two (2) month extension of time for filing a reply to the January 3, 2008 Office Action, and submit the required \$230.00 extension fee herewith.

Should there be any outstanding matters that need to be resolved in the present the undersigned at the telephone number below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By

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